

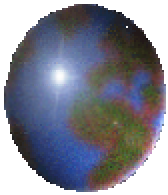
CHALLENGES TO NAVAL MUNITIONS

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14 February 2002

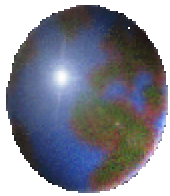




Agenda



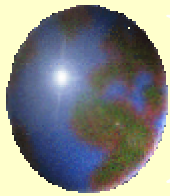
- The Changing Face of Warfare
- National Need for Timely Transition of Technology
- Need for Sustainment of Ordnance Capability



The Changing Face of Naval Warfare

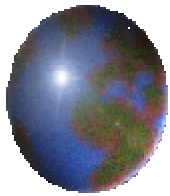


- Naval forces are faced with evolving threats
- These threats will require changes in our ordnance capability
 - Difficult targets (buried, moving, merged into civilian population,)
 - Time critical targets
 - Changing scenarios in threat usage
- Theaters may be far from our shores OR at home
- Weapons must be cost effective



Evolving Threats

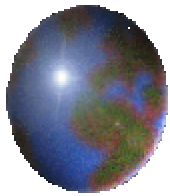




Evolving Threat... *Implications for Ordnance*



- Retain ordnance capability required for traditional threats
- Efficiently develop ordnance to the evolving threat
 - Adapt current ordnance where appropriate
 - Utilize current technology in new ordnance systems
 - Quickly transition new technology
 - Assure safety, logistics and sustainment of capability
- Develop methodology to assess new performance and develop operational tactics
- Be “purple” in strategy to get best weapons for our warfighters



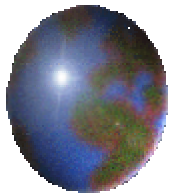
Timely Technology Transition...

Thermobaric Warhead (BLU – 118/B)



- Prime example of new technology and inter-service cooperation between Navy, Air Force, and DTRA
- Requirement for additional capability against caves and tunnels
- Concept to initial capability in 67 days



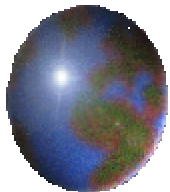


Thermobaric Warhead...

Killing Difficult Targets



VIDEO



Evolving Battlefield...

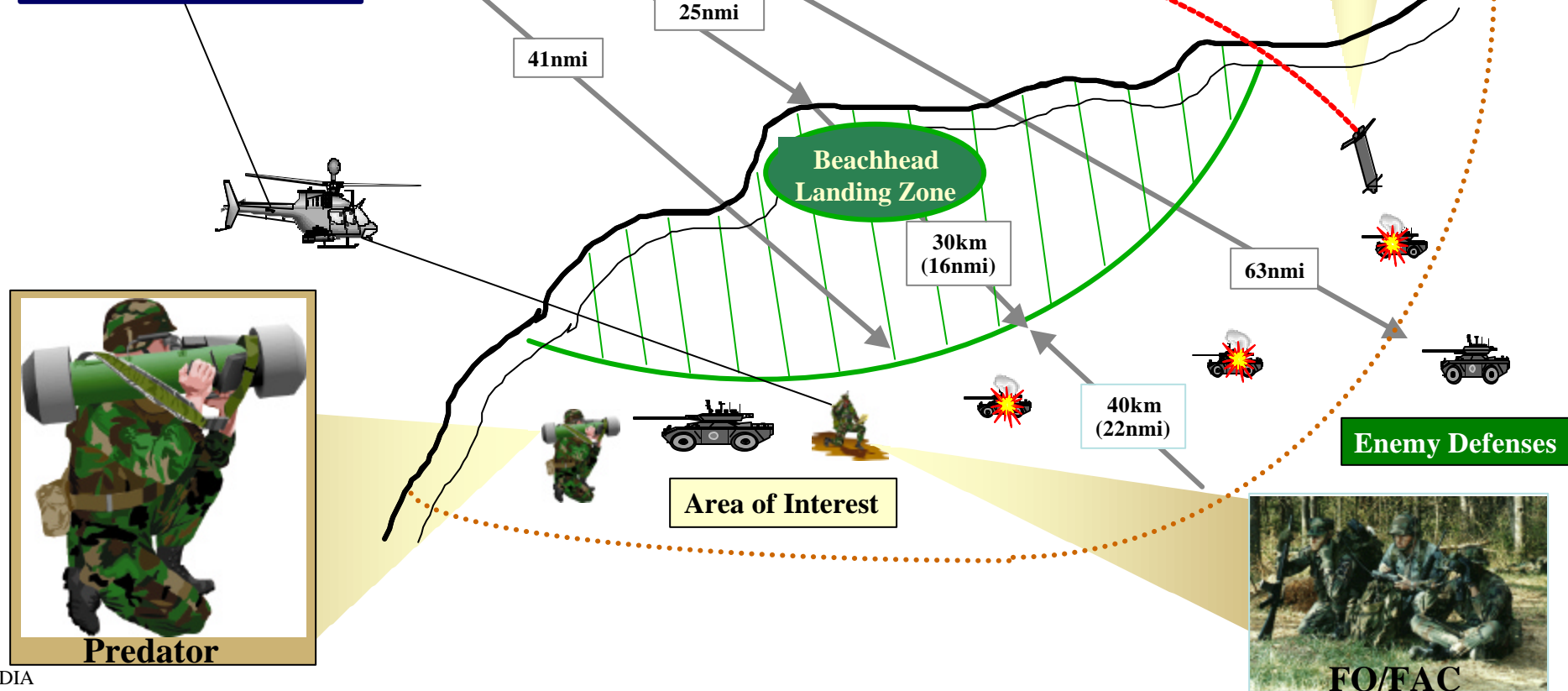
Advances in Naval Gunfire Support

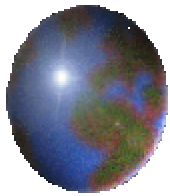


MK 45 MOD 4

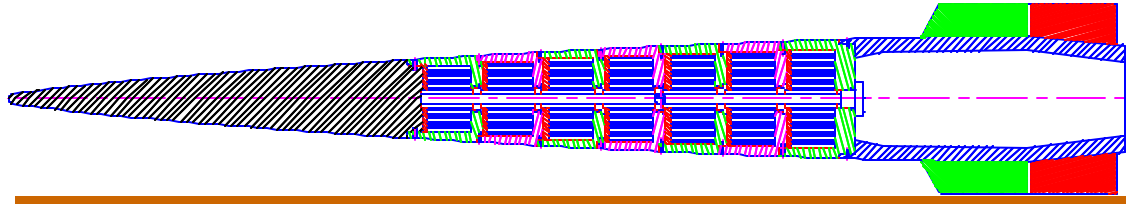


ERGM

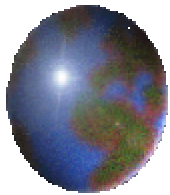




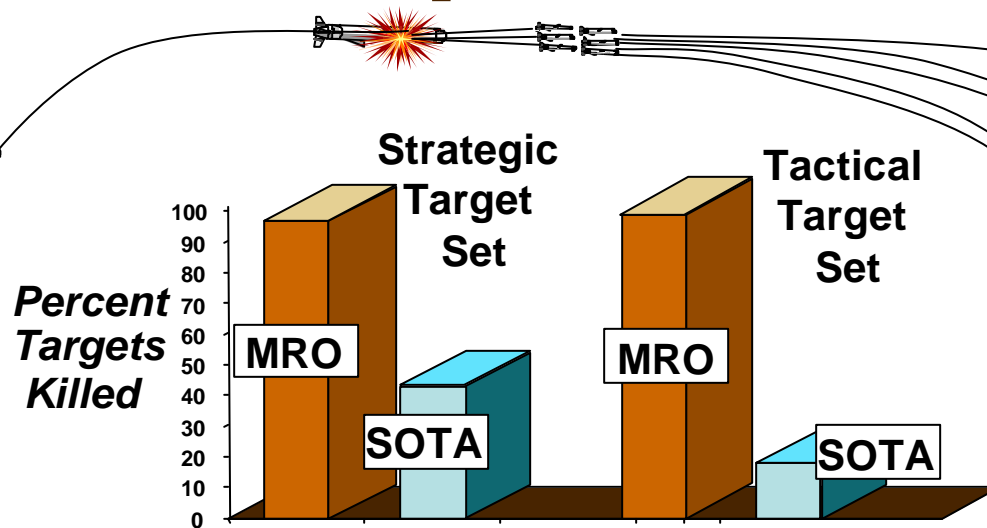
Cost Effective Weapons... Barrage Round Technology



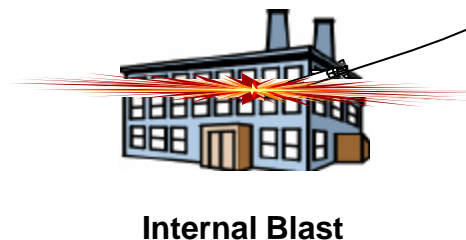
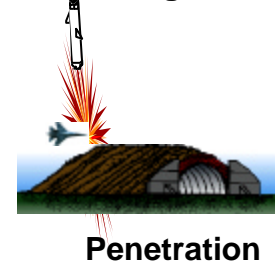
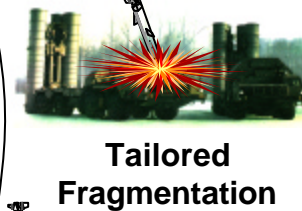
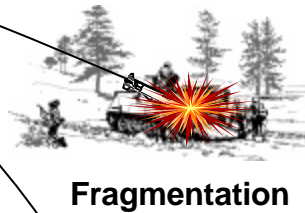
- Future low cost projectile technology for Naval Surface Fire Support and Long Range Strike
 - Leveraging current GPS/IMU guidance technology
 - Real time re-targeting
 - High lethality
 - No explosives
 - Simple...no rocket, no deployed surfaces, no glide
 - Low cost for volume fires

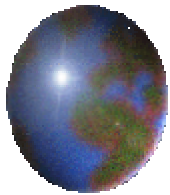


Increased Lethality... Mission Responsive Ordnance



- ➡ **Reduction in rounds required**
- ➡ **Rapid / Flexible Response**
- ➡ **Precision Kill**





Technical Challenge... Safe and Insensitive Munitions

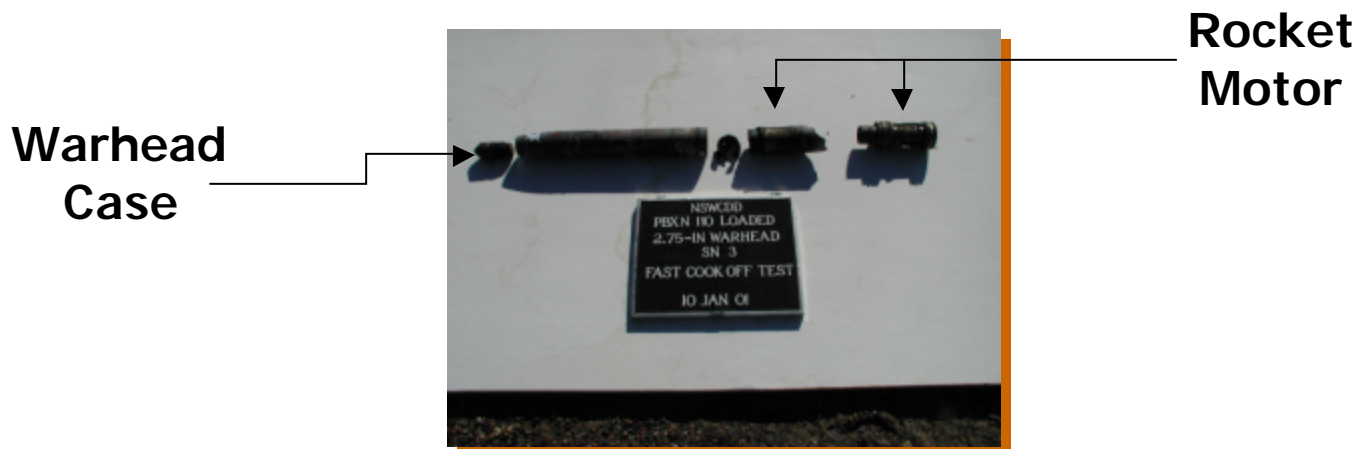


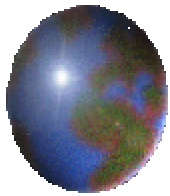
- Significant advances in Insensitive Munitions including...

- Warhead Design
- Insensitive explosive/propellant
- Safe and arm systems
- Shipping containers



- Fast cook-off of 2.75" warhead
 - No warhead case damage
 - Warhead vented as designed

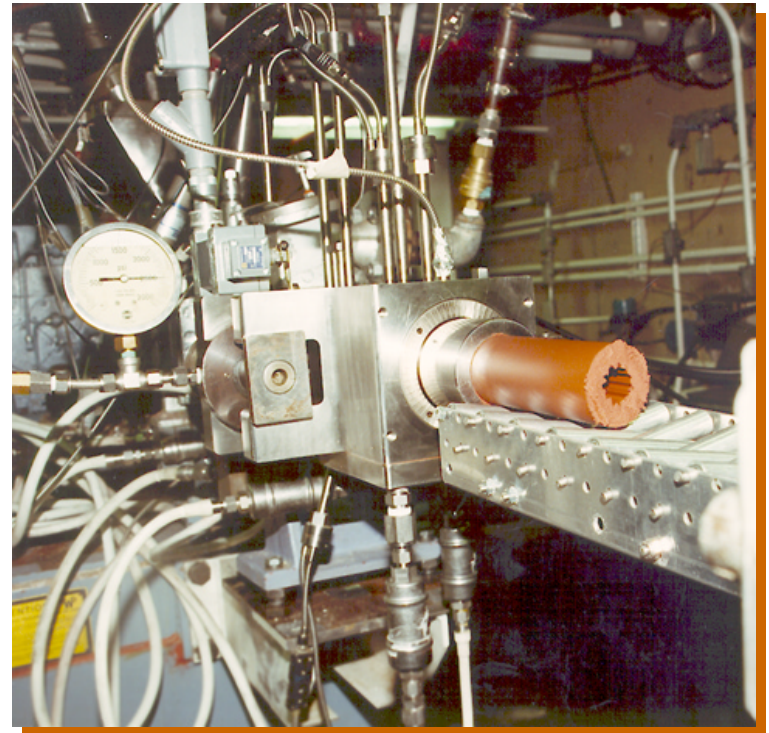


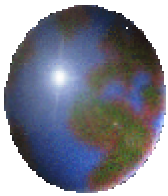


Technology Advances... Continuous Processing



- Capability to continuously handle, mix and process energetic materials
- Cost effective operations compared to current process
- Smaller explosive quantities in process at any one time compared to batch processing
- Reconfigurable to produce variety of energetic materials
- Utilizes less solvent than batch processing
- Opens potential for new binders and formulation not appropriate for batch processing

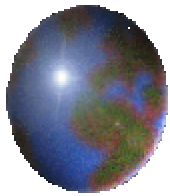




Considerations for New Ordnance



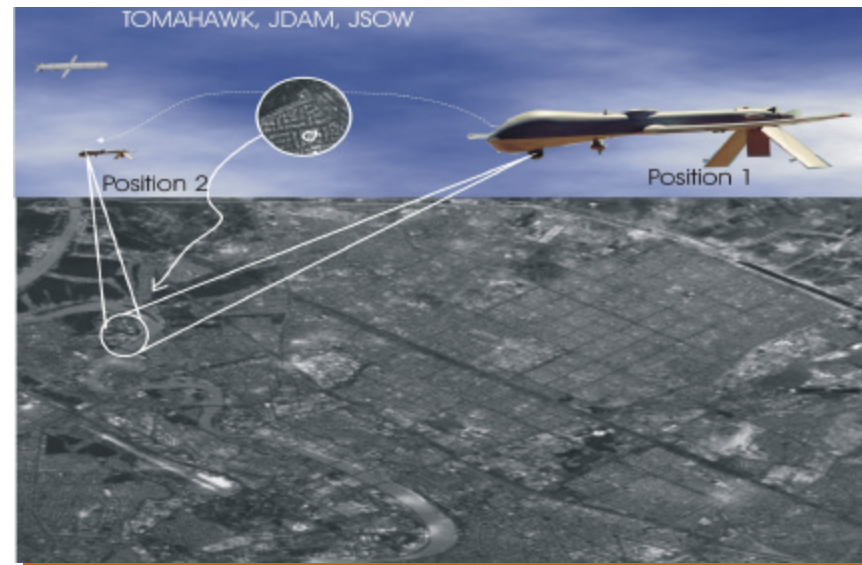
- Payloads for precision weapons
 - Smaller
 - More lethal - less lethal?
- Penetrating payloads
- Mission responsive ordnance
 - Alter capability in flight
 - Adapt kill mechanism to the target
 - “Dial-a-yield”
- Low collateral damage
- Insensitive for force protection
- Multi-use capability

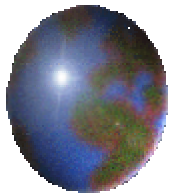


Considerations for New Ordnance (Cont'd)



- Common packaging to improve logistics support
- Safe for our forces
- Cost effective in production, operation, support, and DEMIL
- Environmentally friendly
- Interoperable within weapons systems

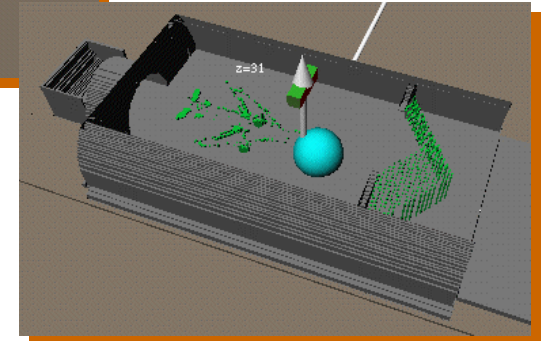
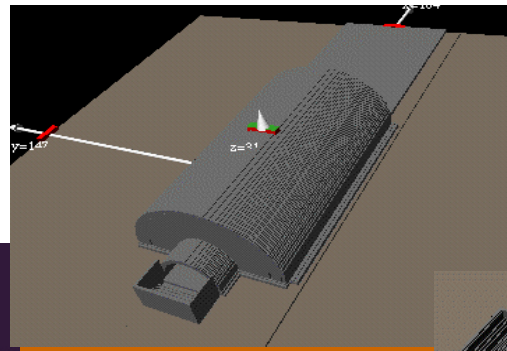




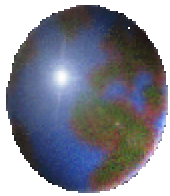
Considerations for New Ordnance (Cont'd)



- Target vulnerability and weapons effectiveness technology must keep pace with weapons technology
- Failures to do so may result in poor decisions in development, procurement, and operational use



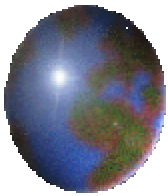
***For Optimal Payoff: Lethality and Endgame Effectiveness
Must Be Involved in All Phases of Design Process***



Timely Transition of Ordnance Technology



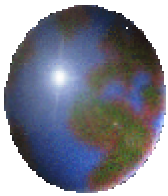
- Defense budgets are going up.... HOWEVER
- Expectations and exigency are high!
- We need to:
 - Focus investments
 - Understand and accelerate the RIGHT technology
 - Develop clear transition paths
 - Provide early assessments of worth
 - Include all elements of an ordnance system
 - Warhead
 - Energetic
 - Fuzing/safe and arm
 - Effectiveness analysis
 - Utilize best ideas of government, industry, and academia



Ordnance Stewardship



- Ordnance must include
 - Mines, warheads, rockets, expeditionary munitions, & ammunition
 - Explosives, energetic chemicals, pyrotechnics, CADS/PADS, advanced energetic materials, and propellants
 - Explosive safety standards and ordnance environmental protection
- Stewardship
 - Strategy for sustainment
 - Provision for long term health in terms of
 - Skills
 - Intellectual capital
 - Facilities
 - Priorities
 - Funding

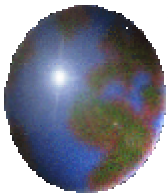


Ordnance Stewardship (Cont'd)



- To ensure the best stewardship of our ordnance we must:
 - Adopt strategy to assure proper identification of need and requirements utilizing a time phased development of capability
 - Include all elements of the ordnance system
 - Advertise needs and requirements
 - Incorporate high degree of cooperation among government and industry capabilities
 - Utilize sources of expertise where available
 - Show off our successes!

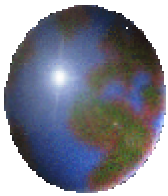
Together we can make it happen!



Challenges to the Navy's Ordnance Program



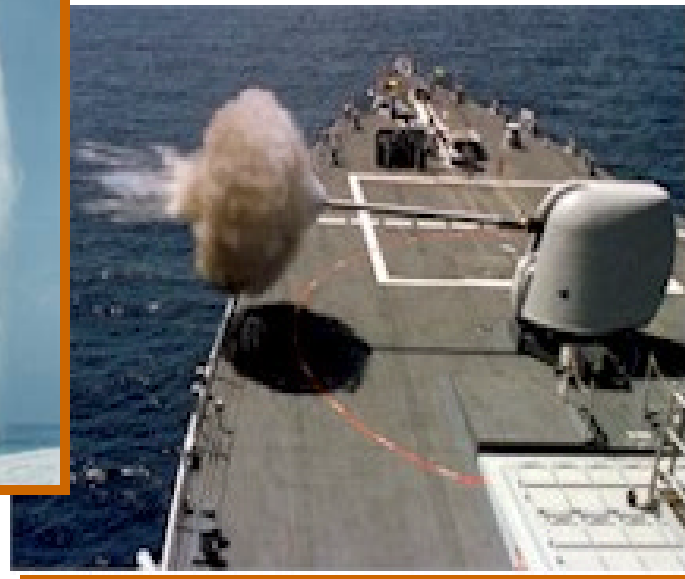
- Ensure a consistent, sustainable workload in key Core Equity and Product Areas
- Maintain critical Military facilities for unforeseen requirements
 - Preserve a workforce that maintains critical skills in Core Equities



Ordnance Stewardship



- " ... a core equity within the Navy. We must ensure that the right capabilities and corporate knowledge survive for the future."
- VADM G.P. NANOS & VADM J.A. LOCKARD
COMNAVSEA COMNAVAIR





Navy Energetics



Organization

Need

SEA



LAND



=

AIR



UNDERSEA



Products & Functions

PROPULSION SYSTEMS

Air Breathing
 Solid Propulsion
 Tactical Missile
 Strategic Missile
 Air/Ground Rockets
 Ship gun projectile
 Mechanisms
 (TVC, Divert, Attitude control)
 Gas Generators
 CADs/ PADs

FUZING

Missile S&A
 Bomb S&A
 Ship Gun s (Projectiles)
 Ordnance Items
 (mines, c'mine, demolition, submunition, mortar)
 Underwater ordnance (mine, c'mine)

WARHEADS

Missile
 Bombs
 Underwater (Torpedo, Mines)
 Gun Projectile (ship launch)
 Ordnance Items
 (mines, c'Mine, demolit'n, submunition)
 Line Charges
 Lethality Assessment

GUNS

A/C Guns & Ammo
 Ship Guns & Ammo
 Conventional small cal. Ammo

PYROTECHNICS

Flares, decoys, markers, smoke
 Torch cutters

MODELING & SIMULATION

Detonation, combustion, ballistics, thermal, structural

MATERIALS

Crystallographic Analysis
 Energetic Ingredients
 Detonation Mechanics
 Formulations(expl. prop. fuels)
 Combustion Analysis
 Hazard & Safety characteristics
 Chemical Synthesis
 Chemical Production & QA

DEMILITARIZATION

R&D Processes
 Verification methods

TRAINING DEVICES

Smoke Signal Launch
 Flash Impact

ENVIRONMENT LIFE CYCLE

TESTING
 Component/System Development

Component/System Qualification
 Component/System Surveillance
 IM Hazards Qualification
 Signature

ENVIRONMENTAL QUALITY

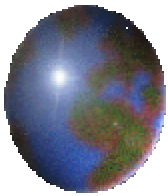
R&D studies
 Facilities Improvements

SPECIAL ITEMS

Magazine Qualification Testing
 Special Forces Applications
 Non-Lethal Weapons
 EOD Support

PROGRAM SUPPORT FUNCTIONS

Inventory repair/upgrades
 FAT/LAT
 Fleet Rapid Response
 AC/Ship Test Support



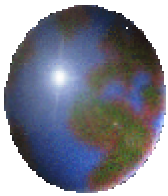
Balancing of Legitimate Interests

Contractor Roles & Interests

- Contractor is typically the primary executing agent
- Contractor has a legitimate interest in making profits
- Contractor's success is our success

Government Roles & Interests

- To define its requirements
- To have continuous assurance that requirements will be met
- To receive fair value for money expended
- To invest and perform in areas where contractor under-invests
- To facilitate success



Special Areas of Naval Leadership



- Weapon System Explosive Safety Review Board (WSESRB)
- Physical security of conventional arms, ammunition, & explosives
- HERO (radhaz)/ordnance
- Ordnance transportation
- Executive manager for DoD EOD technology
- Ordnance logistics

